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Citizens' Bulletin

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We care about eagles National Wildlife Week March 14-20, 1982

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Director gets Distinguished Manager award

Robert E. Moore of Durham, Director of DEP's Water Compliance Unit, is one of the three state managers who have been selected from more than 30 nominees to receive the first annual Distinguished Managerial Service Awards.

The other recipients are Mrs. Johnnie H. Foxworth of Southbury, Assistant Director, Registry and Field Operations, Department of Motor Vehicles, and Dr. Henry C. Lee of Orange, Chief Criminologist, State Police Forensic Science Laboratory, Department of Public Safety.

Governor William A. O'Neill will present the awards at a dinner on February 17.

Moore was named Director of DEP's Water Compliance Unit in 1979, after 14 years of related state and private employment. The unit currently has a staff of 77 persons with an annual operating budget of $2.5 million. It is responsible for administering federal and state water quality regulations and awarding sewage treatment facility construction grants as well as performing field investigations and related research.

Program responsibilities of the unit have expanded under Moore's leadership to include the authority to administer the municipal sewage treatment plant construction grants program for the federal Environmental Protection Agency. (Under this program over $96 million in federal and state monies have been provided for new municipal water pollution control projects in the last two years.)

Moore was instrumental in the establishment of a statewide municipal pretreatment program. Under this program the DEP controls discharges of industrial wastes to municipal sewer systems, providing consistent enforcement statewide and saving local communities the costs that would be associated with controlling such industrial discharges locally.

He has also been actively involved in the state's adoption of comprehensive ground water quality standards as well as a program to implement application of these standards to the "full range of water use from supply to waste disposal." The standards represent the first ground water classification system based on use criteria in the country, and the federal Environmental Protection Agency is considering using Connecticut's program as a national model.

A licensed professional engineer, Moore has lectured at the University of New Haven. He is a Director of the Association of State Water Pollution Control Administrators and chairman of the association's water quality management subcommittee. He recently served as chairman of the Governor's Engineering Task Force on the Water Shortage in Southeastern Connecticut and

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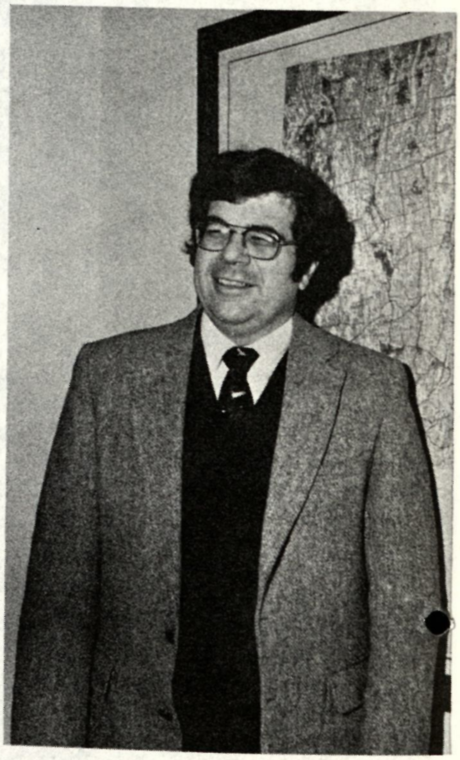


"The Connecticut Department of Environmental Protection is an equal opportunity agency that provides services, facilities and employment opportunities without regard to race, color, religion, age, sex, physical handicap, national origin, ancestry, marital status or political beliefs."

1981 salmon tally:

over 500 fish and 1.5 million eggs

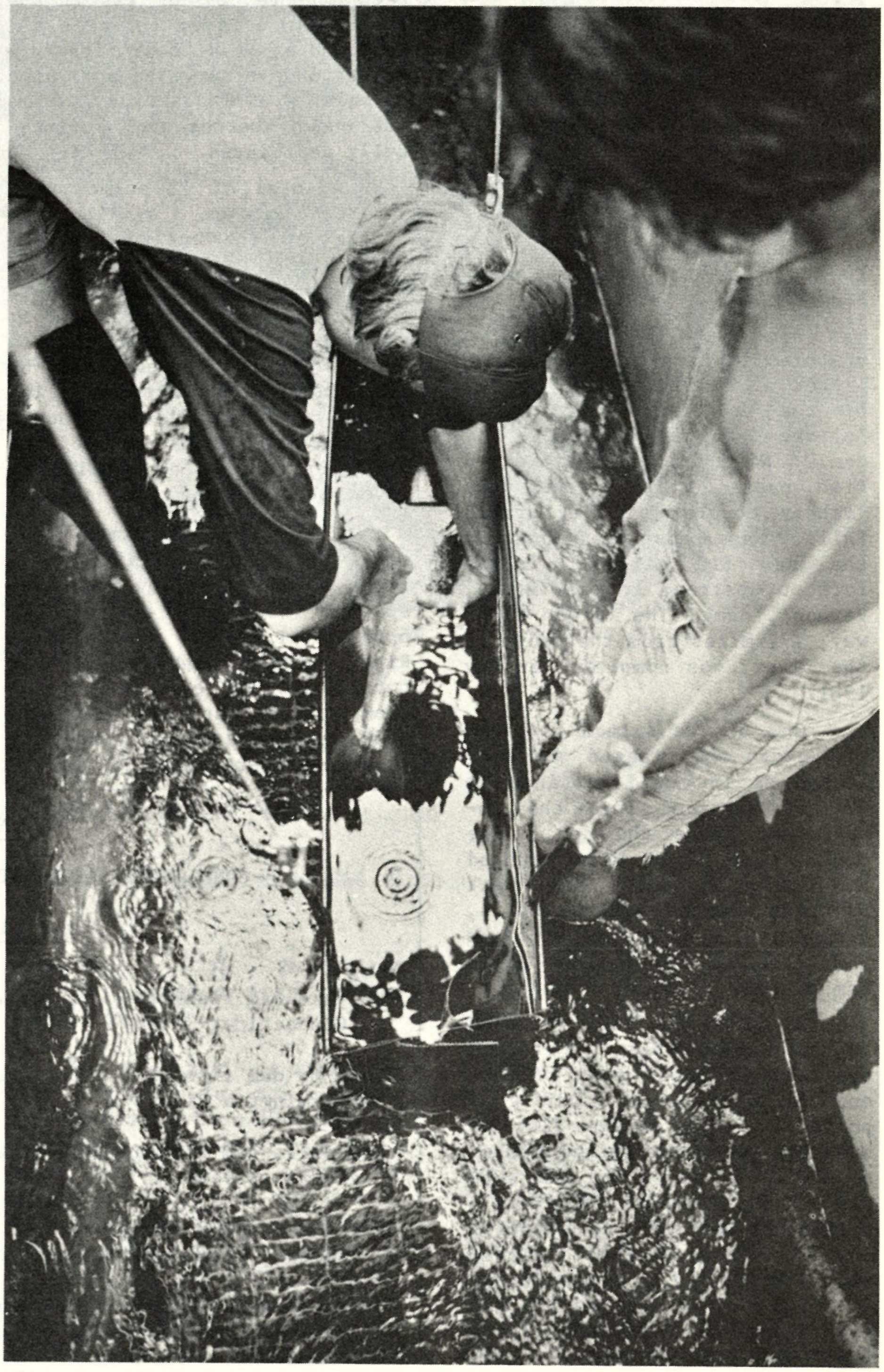
By Stephen Gephard, DEP Fisheries Biologist

As 1981 drew to a close, ice floated on the Connecticut River and fishways were closed for the winter. Despite this inactivity, the year was memorable in respect to Atlantic salmon returning to the Connecticut River watershed as part of the long-term program to restore the ocean-going species.

The first salmon reported in 1981 was caught and released in February from a commercial perch fisherman's net in Essex. There was a long wait for the next fish, which appeared on the end of an angler's line on the Salmon River in East Haddam on April 26. Biologists captured a 29-inch salmon at the Rainbow Fishway the very next day and the run was on, peaking during the Memorial Day weekend. The last spring salmon was captured on July 6, and four fall-run fish were trapped in September and October. The season ended with a surprise. A man fishing in the Connecticut River in Glastonbury caught a large female salmon on December 7, the latest ever reported during the 14-year restoration program. A total of 529 Atlantic salmon were confirmed to have returned to the river during 1981. The previous record year was 1980, when 175 salmon were counted.

As in previous years, salmon captured by biologists at fishways were transported to holding stations to be spawned artificially. The three primary capture locations are at the lowermost dams on the Connecticut River and two tributaries: Holyoke dam fishlift (Connecticut River at Holyoke, Massachusetts); Rainbow dam fishway (Farmington River at Windsor, Connecticut); and Leesville dam fishway (Salmon River at East Haddam, Connecticut). These fish passage facilities were constructed to allow migrating fish to pass over the dams and are now used to capture ascending salmon for use as broodstock. When the number of returning salmon is large enough, many will be allowed to continue upstream to spawn naturally. For now, all young fish produced are raised in hatcheries to maximize survival.

As reported in the Citizens' Bulletin last year, a



Nancy Nassiff photo

Fisheries biologist Stephen Gephard, left, gives an antibiotic to an Atlantic salmon trapped at the Leesville dam. Joseph Parkos, Jr., of East Haddam assists him.

brand new adult salmon holding facility was completed late in 1980. This facility, located in People's State Forest along the Farmington River in Barkhamsted, is designed to hold adult salmon captured at Connecticut fishways. The first salmon arrived on station in April 1981 while DEP personnel were putting the finishing touches on the facility.

Table 1 summarizes the return of salmon by location. Salmon captured at the Holyoke fishlift were taken to the federal holding facility in Hartsville, Massachusetts, and a State of Massachusetts hatchery in Palmer. Fish taken at Rainbow and Leesville were trucked to the DEP facility in Barkhamsted.

Because of extremely large numbers of shad that were being lifted at the same time, thirty of the 317 salmon passed at Holyoke were released above the dam. Nine of these released fish passed through the next fishway complex at the Turners Falls, Massachusetts, dam and the new $10 million fishway farther upstream at the Vernon, Vermont, dam. The Vernon fishway, 172 miles from the mouth of the river, was completed in May 1981.

One of the salmon captured at Vernon was tagged and released so it could continue up the fishway and into the impoundment above the dam. The other eight fish were trucked and released above the next upstream dam at Bellows Falls, Vermont. A fishway will be completed at the Bellows Falls dam by 1984.

Seven of the fish recorded at Leesville also continued upstream, although under different circumstances. During a period of high stream flow in mid-May, an undetermined number of salmon leaped over the west end of the Leesville dam via a series of natural rock pools. (As soon as biologists realized this was occuring, weir boards were erected on part of the dam to prevent water from spilling into the rock pools, assuring that all migrating salmon would have to use the fishway at the east end of the dam.)

Perhaps the person most surprised by that event was an East Hampton man who was fly-fishing for trout two miles upstream on the Salmon River. On May 19, he hooked and fought for nearly an hour an 11-pound Atlantic salmon -- the first salmon documented in the upper Salmon River since 1763. Three other salmon were known to have been captured by anglers in the upper Salmon River later in the year and at least four fish were known to have survived until the November spawning season. It is not known whether they successfully reproduced.

A total of 13 salmon were reported taken by anglers throughout the entire Connecticut River basin during 1981. An additional 19 fish were found, most of them dead, along the shore. Only salmon reported to the DEP and confirmed by fisheries biologists are included in the official count. Program biologists appreciated the cooperation the public has given them in reporting salmon.

The captured salmon that survived at the holding facilities until early November were spawned with one another to produce 1,533,844 Connecticut River strain eggs. Of the total, 370,000 eggs were taken from salmon at the People's State Forest station. Most of those eggs were taken to the DEP trout hatchery in Burlington, Connecticut, where they will begin development before they are transferred to the Kensington Atlantic Salmon Hatchery in Kensington, Connecticut. The Kensington hatchery was converted from trout to salmon production in 1981 and will be the primary Connecticut producer of young salmon smolts that will be stocked back into the river.

The Connecticut River Atlantic Salmon Restoration Program is a cooperative program with upriver states and the federal government agencies. The cooperation of officials from all the involved organizations as well as people within our own agency contributed to the successful year we had in 1981. Many citizens also volunteered their help to the program this year, and their assistance has been deeply appreciated.

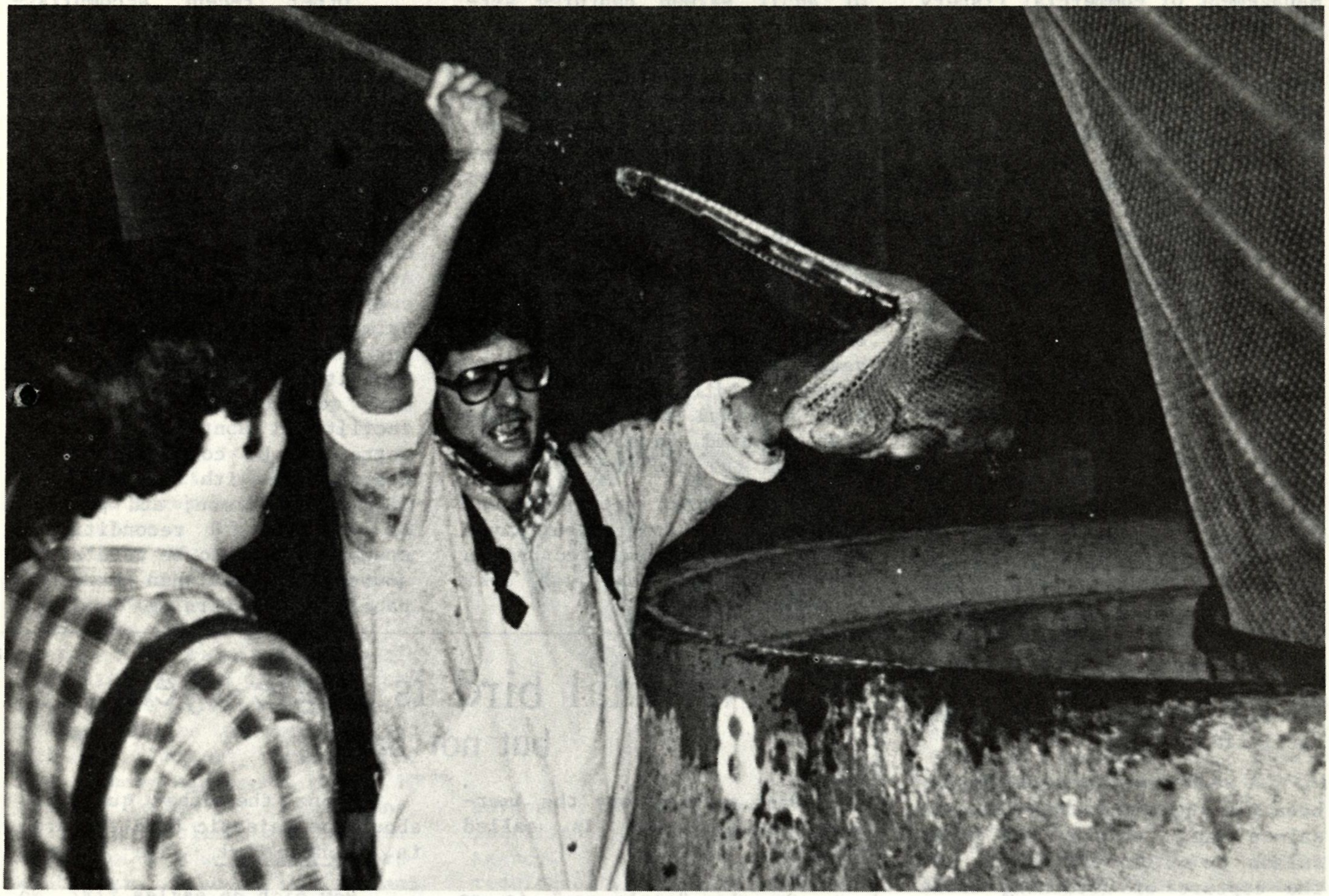
The 1981 adult salmon run was large because a large number of young salmon were stocked into the rivers in 1979. By contrast, the adult runs in 1982 and 1983 will probably not be so large because relatively few fish were available for stocking in 1980 and 1981. However, after the two-year lull, long-term forecasts call for ever-increasing numbers of returning salmon during the remainder of the 1980s. ■

TABLE 1.

CONNECTICUT RIVER ATLANTIC SALMON ADULT RUN

Final Figures: 1981

Holyoke dam fishlift (Connecticut River)	317
Rainbow dam fishway (Farmington River)	62
Leesville dam fishway (Salmon River)	118
Reported angler catches (Various locations within the watershed)	13
Miscellaneous reports confirmed by biologists (Various locations within the watershed)	19
Total	529



William Reavey, DEP Research Assistant, left, and Richard Van Nostrand of the Peoples Forest Holding Facility, right, take a salmon from a tank for stripping.

Stephen Gephard photo

Four states, two federal agencies

have collaborated to restore salmon

By Peter Minta, Anadromous Fisheries Biologist

With the passage of the Anadromous Fish Conservation Act in 1965, state conservation agencies were able to obtain federal aid which provided the impetus for the Atlantic salmon restoration program in the Connecticut River basin. This program became a reality when, in June of 1967, a formal agreement to support this restoration effort was signed by the states of Connecticut, Massachusetts, Vermont, and New Hampshire and two federal agencies, the National Marine Fisheries Service and the United States Fish and Wildlife Service. By this agreement, the Connecticut River Anadromous Fish Management Program became a joint state-federal venture.

The planning and coordination necessary for the restoration program (which involves all anadromous fish species, i.e., those which go up rivers to spawn) rests with two committees, a policy and a technical committee. The policy committee includes the chief or director of each of the state and federal resource agencies, and its function is to establish and approve policy for the program. Fisheries biologists from each of the state and federal resource agencies serve on the technical committee. This committee acts as advisors to the policy committee in the formulation of programs and policy.

Objectives of the program have been two-fold: 1) to strive for the realization of the full potential of the anadromous and resident fishery resources of the river in order to provide the public with high quality sport fishing opportunities; and 2) to assist in providing for the long-term needs of the human population for food through the development and management of commercial fishery resources.

Since the beginning of the present program, one major emphasis has been the planning, design, and construction of fishway passage and trapping facilities on Connecticut River main stem dams as well as on dams on two major tributaries, the Farmington and Salmon Rivers. The accomplishments on the Connecticut River main stem to date are completion of an adequate fishlift and trapping facility on the Holyoke dam in Massachusetts, a fishway passage complex on the Turners Falls dam system in Massachusetts, and a fishway passage facility on the Vernon dam at Vernon on the Vermont-New Hampshire border. A fishway facility on the Bellows Falls dam (Vermont-New Hampshire) is slated for completion in 1984. The lowermost dams on the Farmington and Salmon Rivers have also been equipped with fishway passage and trapping facilities.

A second major emphasis has been the acquisition of Atlantic salmon eggs, raising the young salmon to stock-out size, and the capture of returning adult Atlantic salmon for brood stock purposes. Adult returns are being used to establish a genetic strain compatible with the environmental and physical demands encountered in the Connecticut River which is in the southernmost range of this species, from which native salmon have been gone for nearly 200 years.

The Atlantic salmon restoration effort became an apparent success of some magnitude when juvenile or pre-smolt salmon stocked in 1976 produced the first substantial numbers of adults returning to the Connecticut River in the spring of 1978. That year a total of 90 returning fish were counted. Although most of those first adult salmon that were captured died before they could be used as brood stock, the significant fact was that Atlantic salmon could and did return to the Connecticut River.

The development of improved handling techniques for the 1979 run meant that a high percentage of adult salmon captured survived to be used as brood stock, and these were successfully spawned in the fall producing 126,000 eggs of the "Connecticut River strain." In 1979 a total of 60 salmon entering the Connecticut River system were counted.

The year 1980 saw an increasing number of returns with 175 adult salmon accounted for. With the knowledge and experience gained in the previous two years, greater success in adult salmon holding resulted in a high survival rate among those fish captured alive, with an egg take in the fall of 312,000.

The largest return in the history of the Connecticut River Restoration Program occurred in 1981, and egg take was over 1,000,000.

Other recent accomplishments of the program include the completion of the White River Atlantic Salmon Hatchery in Bethel, Vermont; the conversion of the Palmer Trout Hatchery in Palmer, Massachusetts, to the Roger Reed Salmon Hatchery; the conversion of the Kensington Trout Hatchery in Kensington, Connecticut, to the Kensington Atlantic Salmon Hatchery; the completion of an Atlantic Salmon Holding Facility in Barkhamsted, Connecticut, with a capacity of 200-250 adult salmon; work on a salmon holding facility at Montague, Massachusetts, to be completed in the near future with a capacity of 500 adult salmon; and progress of programs for reconditioning spawned salmon to be used as egg sources in years when there is a paucity of returning adults. ■

National bird is eagle-eyed

but not bald

Want to know why the American bald eagle is called "bald?"

Or why "eagle-eye" is an apt description for someone with good eyesight?

These are just two of many questions about America's national bird answered in the current issue of Ranger Rick, the National Wildlife Federation's monthly publication for children.

A bald eagle isn't bald at all. His head is covered with white feathers. The word bald comes from the Old English word "balde," which means white.

And "eagle-eye" refers to the eagle's extraordinarily keen eyesight, which enables some of them to spot a fish from more than a mile away. An unusually high number of "cone cells," or specialized vision cells, give the eagle's eye its long-distance focusing capability, says the magazine. The extra cells also make the eagle's eye large in proportion to the rest of his body. Some eagles have eyeballs larger than a human's.

Among the other questions about the majestic bird answered in Ranger Rick are these:

How high do eagles fly? No one knows for sure. But they do fly high--even out of sight--by riding on top of rising columns of air, called thermals.

How big is the bald eagle's nest? They are often huge, because eagles (who mate for life) tend to use the same nest, piling new materials on top of the old year after year. One of the largest nests ever found weighed more than a ton and measured 20 feet deep by 9 1/2 feet across. A new nest is small by comparison--about three feet deep and five feet across.

Do eagles nest in the same place year after year? Not always. Some pairs have several nests in the same area, and they use a different one each year. But one pair of eagles nested in the same place for 20 years.

How much do eagles weigh? A mature American bald eagle weighs between eight and twelve pounds. Most female bald eagles weigh a little more than their mates. ■

P-R Program

provides funds for wildlife

By George Brys, DEP Wildlife Biologist

Since its initiation in 1937 the Federal Aid in Wildlife Restoration Program, often called the Pittman-Robertson or P-R Program after its legislative sponsors, has provided more than one billion dollars to restore and maintain America's wildlife. Monies to operate the program are collected from an 11 percent excise tax on sporting rifles, shotguns, ammunition, and archery equipment, and a 10 percent excise tax on handguns. The taxes, collected from manufacturers by the federal government, are passed on to and eventually paid by sportsmen. They are deposited in a special fund, the "Federal Aid to Wildlife Restoration Fund," which is administered by the U.S. Fish and Wildlife Service. After deducting a modest sum for administration, the remaining funds are apportioned to the states in accordance with a formula, specified in the Act, which is based on the land area, population, and number of paid hunting license holders in each state. U.S. territories receive a fixed percentage of funds. States and territories eligible to participate have two fiscal years in which to utilize the funds, following receipt of the apportionment. Funds not used within this period revert to the U.S. Fish and Wildlife Service and are usually used to carry out the purposes of the Migratory Bird Conservation Act.

To be eligible to participate in the P-R Program, states must have passed legislation prohibiting the diversion of hunting license fees for any purpose other than administration of the state wildlife agency. Having met this requirement, state wildlife agencies get apportioned funds by preparing and submitting project proposals to the U.S. Fish and Wildlife Service for review and approval. Each project must address and be designed to meet a specified need. Once a project is approved, the state carries out the work and upon completion is reimbursed for up to 75 percent of approved costs.

The kinds of projects approvable are varied, giving each state the flexibility to determine and address its own needs. Project classifications include development, research and survey, land acquisition, technical guidance, coordination, and hunter education. P-R funds may not be used for law enforcement or public relations purposes.

Development activities are directed toward improving wildlife habitat, managing wildlife areas, and providing for public use of wildlife resources.

Research, including surveys, investigations, and basic studies, is primarily directed toward assisting and improving management efforts to meet responsibilities to the resources and to recreationists.

Land acquisition projects are directed at increasing the amount of wetland, forest, and farmland acreage in public ownership for wildlife habitat and related recreation.

Technical guidance activities assist private landowners and governmental agencies with land management responsibilities in improving environmental conditions to benefit wildlife, protecting or creating habitats favorable to wildlife, and managing wildlife populations and areas for increased production and public use. Guidance may be provided only to individuals and agencies requesting advice and in a position to implement recommendations furnished.

Coordination projects include funding the activities of the state wildlife agency's Federal Aid Coordinator and selection, planning, and supervision of other projects; documentation and vouchering of reimbursable personnel costs and project expenses; and liason with the U.S. Fish and Wildlife Service.

Hunter education projects include training in the safe handling and use of firearms and archery equipment, hunter responsibilities and ethics, survival, and wildlife manage-

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1982: The Year of the Eagle

The National Wildlife Federation has called upon the nation to observe 1982 as the "Year of the Eagle" to commemorate the 200th anniversary of the selection of the bald eagle as our national symbol.

The bald eagle, now an endangered species throughout most of the country, was adopted as the central figure of the great seal of the United States by the second Continental Congress on June 20, 1782, six years after a committee consisting of Benjamin Franklin, John Adams, and Thomas Jefferson was named to recommend an official seal for the newly-independent country.

"By June, the bald eagle will have served as our national bird and symbol for 200 years," said Dr. Jay D. Hair, executive vice president of the NWF. "An eagle bicentennial will remind all Americans of our wildlife heritage--a priceless natural resource that we must manage wisely if it is to survive--and it will also remind us of the virtues--the strength and courage--that the eagle symbolizes."

On the national seal and also the Presidential seal the eagle carries an olive branch, signifying the country's desire for peace, in one talon. In the other it holds a bundle of 13 arrows, symbolizing the willingness of the 13 colonies to fight for freedom.

The high-powered committee appointed to develop a national seal, which included two future Presidents, was created on July 4, 1776, the same day that the colonies declared their independence from England. Benjamin Franklin later said he opposed the choice of the eagle on grounds that it was a cowardly creature of "bad moral character" that stole its food from other birds.

In a letter he wrote in 1784, Franklin said he had favored the turkey gobbler a the national bird despite the fact that turkeys were sometimes "vain and silly."

Zoologists dispute Franklin's contention that the bald eagle, a bird found only in North America, is a "rank coward." After years of study by

Irene Vandermolen photo

We Care About Eagles

three committees, William Barton, a Philadelphia expert on heraldry (and brother of Benjamin Barton, a well-known naturalist), submitted a design to Charles Thomson, secretary of the Continental Congress, and Thomson presented his drawing, with some changes, to the Congress.

The U.S. was by no means the first country to use an eagle--there are more than 50 species of the bird worldwide--as its symbol. Eagles appeared in the heraldry of Mesopotamia more than 3,000 years before Christ and served as emblems for Roman emperors, Charlemagne, Napoleon, and Peter the Great.

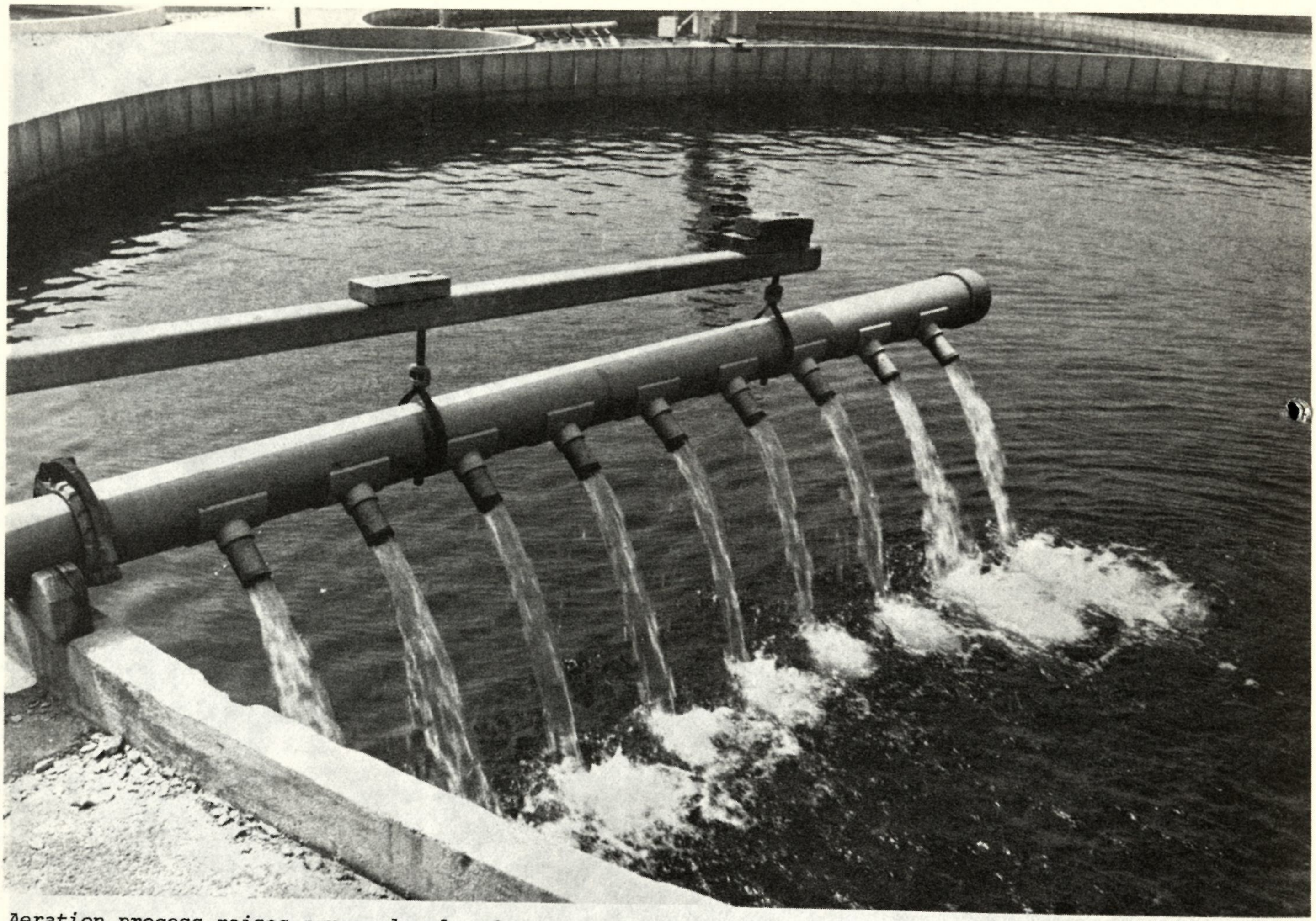
Ornithologists believe the bald eagle soared over all of the present "lower 48" states when the first Europeans arrived on this continent. Their numbers declined steadily as settlers pushed back the frontier and destroyed their wilderness habitat, then fell sharply in the 1950s and 60s as DDT, deildrin, and other man-made pesticides contaminated their food supplies. The indiscriminate use of these deadly pesticides was outlawed in the early 1970s.

Shooting has also taken its toll of the "bird of freedom." Until 1940, when Congress passed the Bald Eagle Protection Act, some states actually paid bounties for carcasses of the predatory "varmint" bird. The federal protection law was reinforced by the Endangered Species Act of 1966 and 1973 and by a campaign by the National Wildlife Federation to stamp out illegal shooting of the bird.

Since 1972 the NWF has paid 13 $500 rewards for information leading to the conviction of eagle killers--a program that the U.S. Fish and Wildlife Service now duplicates as a deterrent to eagle poaching. Since the national Bicentennial of 1976, when it established the NWF Raptor Information Center to serve as a clearinghouse for data on eagles and other birds of prey, the Federation has also acquired and placed under the protection of wildlife agencies eagle roosting sites in five states.

Each January the NWF conducts a bald eagle census in the "lower 48" states which is considered to be the most thorough count conducted in the U.S. The Federation has also lobbied and been involved in several lawsuits in efforts to safeguard habitat for the nation's symbol.

The bald eagle is now listed as "endangered" in all but five of the lower 48 states. In Minnesota, Wisconsin, Michigan, Washington, and Oregon it is listed as "threatened." In the 49th state, Alaska, bald eagles are plentiful and in the 50th, Hawaii, they are nonexistent. ■


Audrey Handelman photos

Aeration process raises oxygen levels of ground water used at hatchery.

Quinebaug Hatchery

helps nature along... with brook, brown, and rainbow trout

By Audrey Handelman, Environmental Intern

Increasing human population has put pressure on many natural systems, from timber stands to deer herds. As demands for natural resources have grown, those who realize that these resources may be limited have become more concerned about the earth's capacity to support human activities.

Fishing, recreational as well as commercial, takes its toll on the resources of Connecticut's waters. Approximately 400,000 anglers eagerly await the beginning of fishing season each year; about 210,000 are licensed adult fisherman, and the rest are juveniles. Fishing puts great pressure on fish populations, especially upon desirable species such as trout.

Natural reproduction would soon fall far short of producing the quantities of trout needed to satisfy Connecticut's fishermen. To help nature along, the state has been stocking Connecticut's lakes and rivers with large numbers of brook, brown, and rainbow trout.

The Quinebaug Valley Hatchery in Plainfield is the State's newest and most modern hatchery. Constructed in 1971 with State funds and matching funds from the Bureau of Outdoor Recreation, it now operates at close to its maximum capacity, producing about 600,000 fish a year. "We're one of the largest and most advanced hatching facilities on this side of the Mississippi," says hatchery manager Dave Sumner, who has been working at Quinebaug for almost nine years.

Despite the facility's high output, it has remained disease free. The reason for this, according to Sumner, is the precautions taken at Quinebaug: no visitors are allowed in the production area of the hatchery, and eggs and resulting fish brought in from other hatcheries are kept in quarantine for two years before being allowed to come in contact with hatchery stock.

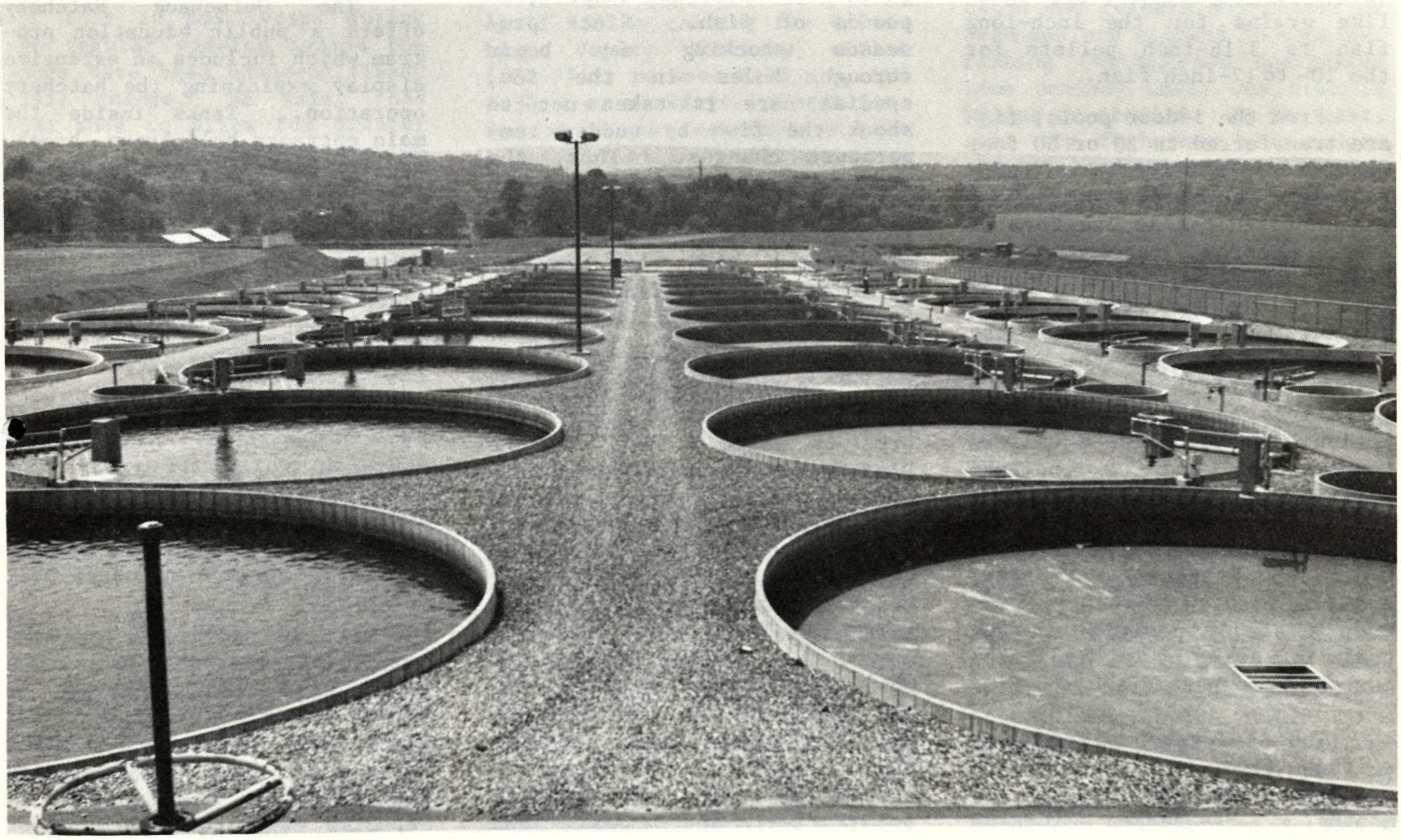
Raising over half a million trout each year is a time-consuming job. "There's always something to be done," says Sumner, whether it's cleaning tanks, spawning, stocking, or sorting fish, or keeping up the grounds. "Right now we're a little short-handed." Usually, there are two managers and seven maintainers; right now, Sumner and assistant manager Dave Tillinghaft are operating with four maintainers.

The first step in raising trout is to obtain, manually, the eggs from the females and the milt (sperm) from the males and mix the two. In addition to producing its own population, from brood stock maintained at the hatchery, Quinebaug supplies eggs to the State's other fish-rearing facility, Burlington hatchery. The process of gathering the eggs takes the staff about three months.

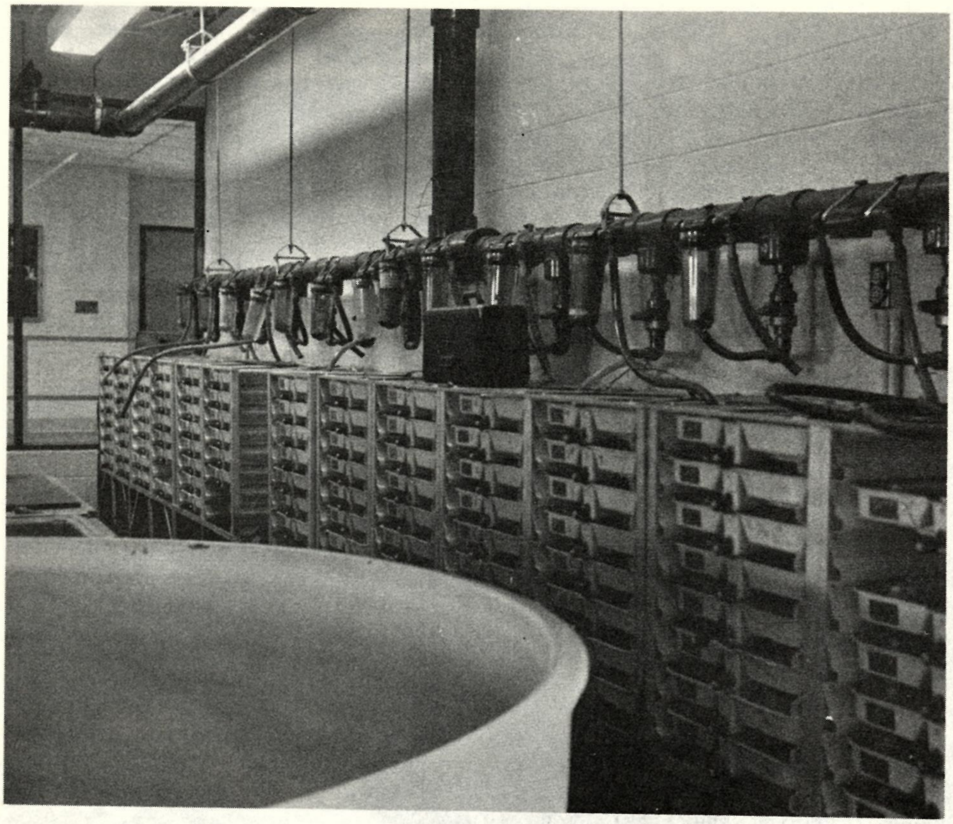
Fertilized eggs remain in incubator trays in the hatchery production area for about 40 days. During the first 22 days of incubation, the 1.5 million eggs in the bank of incubator trays must not be disturbed; any shock will kill the developing embryos. When the eggs reach the "eyed stage" after 22 days, and the eyes of the developing fish become visible through the shell, they may be handled without danger and may even be shipped long distances out of water if kept cool and damp. Once they are at the "eyed stage," all dead or unfertilized eggs are picked out, leaving only those which will hatch.

After hatching, the fish are transferred to six foot diameter tanks indoors in the production area. Each tank can hold as many as 30,000 newly hatched trout. About a month after hatching, the yolk sacs attached to the trouts' abdomens since birth and used as a food source will have been used up, and the fish will begin receiving food. Feeding is usually done by automatic feeders operated from the hatchery office.

From hatching on, fish must be sorted continually according to size, since the quantity and size of their food increases



Outdoor fish rearing pools at the Quinebaug Valley Hatchery.



Eggs are incubated in bank of trays inside the hatchery.

with each increment of growth. The fish will receive a total of nine different sized food pellets, ranging from tiny, sand-like grains for the inch-long fish to 3/16-inch pellets for the 10- to 12-inch fish.

From the indoor pools, fish are transferred to 20 or 50 foot rearing pools outdoors. Traditionally, hatchery pools have been constructed in the form of long, narrow raceways. Recently, however, fish raisers realized the benefits of round rearing pools to the fish: the circular flow of the water allows the fish to distribute themselves evenly; the circular motion also maintains a uniform temperature and a uniform distribution of dissolved oxygen. The cleansing action of the circulating water flushes waste out of the central drain, and the fish, in attempting to keep a steady position in the pool by swimming against the current, grow stronger.

The time required to raise a fish from fertilization to stocking size is 16 to 18 months. Pre-season stocking begins March 1; the hatchery staff does all the stocking, using hatchery stocking trucks. Each truck holds 600 to 700 gallons of water and about 1,200 pounds of fish. Since pre-season stocking may begin through holes in the ice, special care is taken not to shock the fish by sudden temperature changes. Thus, the water in the pails used to transport the fish from truck to stocking water is tempered with water from the lake or river to gradually accustom the fish to the colder water.

The most important component of the hatchery operation at Quinebaug, as at any hatchery, is water. In fact, the Plainfield site was chosen from five around the state because of the abundance and high quality of the water in the Quinebaug basin. The facility, fed ground water from seven sand and gravel wells, is capable of producing up to 8.5 million gallons of water per day, or enough to meet the needs of a municipality of 80,000. Ground water is preferred to surface water in hatchery operations because it is free from bacteria and parasites and its temperature is constant and uniform at about 52 degrees all year.

The one drawback to using ground water is that its dissolved oxygen content is too low for trout species. Therefore, the water must be aerated before entering the hatchery. It passes through an aspirator which raises the dissolved oxygen content to about 10.5 parts per million. From the aspirator, the water flows through the fingerling pools, then through drains to settlement basins from which it returns to the lower chambers of the aspirator. It is then reused in the 50 foot pools, through which it passes by gravity.

Fish waste and uneaten food could become a significant pollution problem if not handled properly. To avoid this, organic substances are allowed to settle in settlement basins adjacent to each series of pools. These basins are drained at least twice a week, and the solids which have accumulated in them are pumped into a septic tank at the far end of the hatchery.

The Quinebaug Hatchery offers a public education program which includes an extensive display explaining the hatchery operation. Tanks inside the main entrance hold brown, brook, and rainbow trout specimens, and three outdoor rearing pools are open for public viewing. Hatchery hours are 10 a.m. to 4 p.m., seven days a week. Sumner also gives tours and presents slide shows for schools and other interested groups.

There is even fishing at the hatchery in two special ponds at which the public may fish during weekends and holidays from early March to mid May. Three hours of fishing costs $1; anglers may keep only one fish.

If it weren't for the hatcheries, many State fishermen would find themselves out of luck. "Natural populations," says Jim Moulton of DEP's Fisheries Unit, "could not provide the level of fishing success expected for the number of persons in the State who fish."■

Public fishing ponds

available to groups after season opens

A major change will be made in the operation of the public fishing ponds at the Quinebaug Valley Hatchery in Plainfield during the coming season.

The fishing ponds will open on Saturday, March 6, and will be operated on weekends and holidays through the end of May, initially in the same manner as during prior years. However, this year following the opening of the regular fishing season on April 17, the ponds will be available to youth oriented, handicapped, and senior citizen organizations by advance reservation.

Robert Jones, Director of DEP's Fisheries Unit, pointed out that in past years during the regular fishing season the ponds have been under-utilized. "This change," he said, "has been made to allow for greater use of the ponds and to provide a facility ideally suited for youth instructional programs, for the mentally and physically handicapped, and for senior citizens."

The public fishing facility at the Quinebaug Valley Hatchery consists of two ponds, each two acres in size. One pond is restricted to fly fishing with a single barbless hook. The other pond is restricted to fishing with lures with a single barbless hook. Each pond is stocked with more than 1,000 trout from nine inches up. Some fish weighing more than three pounds are included. A wheelchair ramp is provided at each pond for those requiring special facilities. Admission to the ponds is by permit only, a fee of $1.00 per angler is charged, and each unlicensed angler under 16 years of age must be accompanied by a licensed angler 21 years of age or older.

Each permit holder is allowed to fish for a three hour period. From March 6 through the last weekend in April, there will be three periods per day: 8:00 a.m. to 11:00 a.m.; 11:30 a.m. to 2:30 p.m.; and 3:00 p.m. to 6:00 p.m. Starting May 1, there will be four periods per day: 6:30 a.m. to 9:30 a.m.; 10:00 a.m. to 1:00 p.m.; 1:30 p.m. to 4:30 p.m.; and 5:00 p.m. to 8:00 p.m.

Permits can be obtained by telephone reservation. Starting January 18, individual reservations may be made for the preseason period (March 6 through April 11) by calling the Quinebaug Valley Hatchery office (564-7542) between 8:30 a.m. and 3:30 p.m. weekdays. Vacancies, for which no reservations were received, will be filled on a first come, first served basis 15 minutes after the start of the fishing period. Reservation holders who fail to appear within 45 minutes of the start of the period will lose their permit privilege, and these vacancies will also be filled on a first come, first served basis.

Starting March 1, group reservations may be made for the period set aside for group use (April 17 through May 31) by calling the Fisheries Unit in Hartford (566-2287). Reservations for group use must be made one week in advance. Groups numbering 15 or more individuals may request exclusive use of one of the ponds. Other rules such as the use of artificial flies or lures, one-to-one youth/adult supervision ratio, and parking restrictions can be waived by special request when the reservation is made.

During the portion of the season set aside for group reservations, no individual reservations will be accepted. Individuals may, however, take advantage of the facilities during any time periods for which there are no advance group reservations. Anglers should call the hatchery to check on the group reservation status for the period in which they are interested. During unreserved periods, walk-in anglers will be admitted on a first come, first served basis.

Anglers are allowed to catch and release any number of fish and are allowed to continue fishing (within the designated time period) until one fish is killed or creeled. In the past, some fly fishermen have caught and released as many as 60 trout during three hours of angling.

Under the new group reservation system, these ponds can provide an excellent classroom for training young anglers as well as providing a recreational opportunity for the handicapped and others who could not otherwise enjoy the experience of fishing. ■

Land trust

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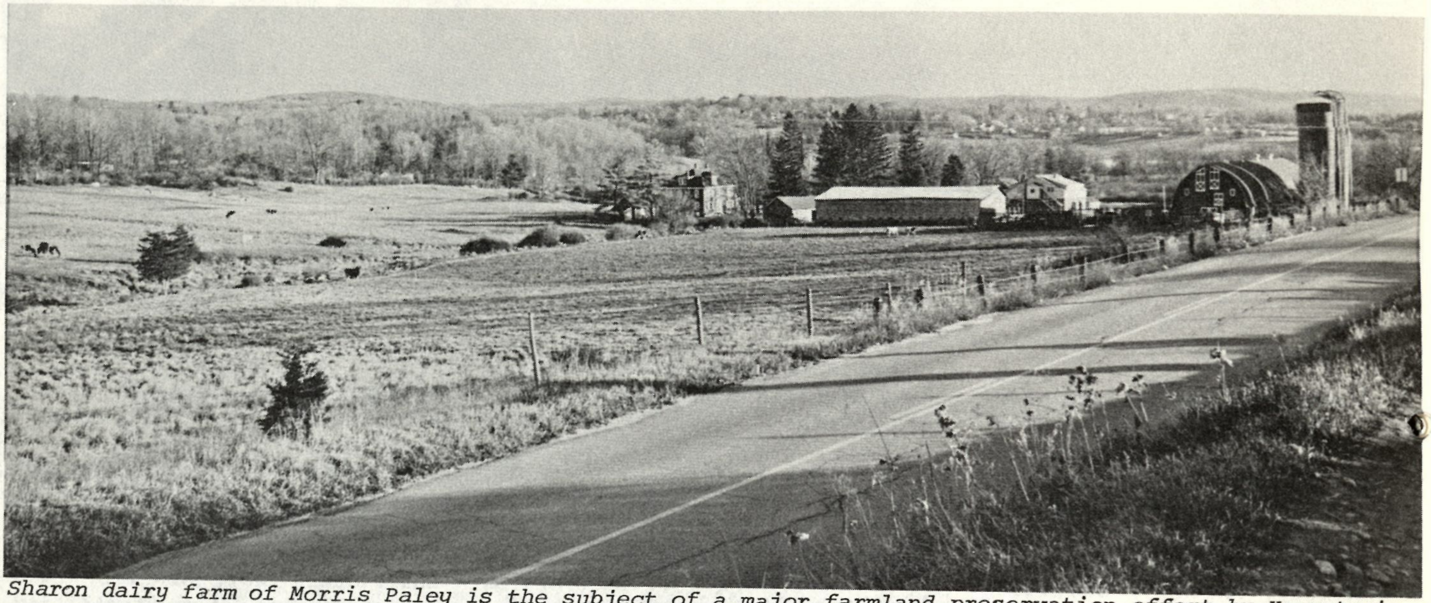
eral towns and land protection advice to landowners. In addition, a trust brochure outlining the trust project and a landowner informational package providing specifics to landowners on methods of permanently protecting their lands are scheduled for distribution by February 1982. Inquiries on the Housatonic Land Preservation Trust can be directed to Randi Lemmon at 672-6673. ■



Sharon dairy farm of Morris Paley is the subject of a major farmland preservation effort by Housatonic Land Preservation Trust.

H.V.A.

adds land trust to protect Housatonic riverfront, farmlands, recreation

By Leila Baroody, Environmental Planner, Housatonic Valley Association

With the creation of the Housatonic Land Preservation Trust (HLPT) in the fall of 1981, the Housatonic Valley Association (HVA) has added a new direction to its land protection efforts. HLPT is organized as a distinct entity within HVA to act as the planning and land protection arm of the organization.

The HVA is involved in river basin activities from the headwaters of the Housatonic River in northern Massachusetts to the Long Island Sound. It is a non-profit organization with membership in all 45 of its Connecticut watershed communities. The main purpose of HVA is to protect and preserve the natural environment of the Housatonic Valley by the encouraging the best conservation and land use practices.

To this end, the HVA's new land trust division has set forth several specific goals. They are:

1) The protection of the Housatonic riverfront lands for the purpose of preserving water quality and scenic beauty in the region;

2) The protection of productive farmland in the region; and

3) The protection of valuable recreational opportunities--boating, fishing, hiking--within the watershed, with particular attention to the Appalachian Trail and other side trails in the region.

HLPT's land trust activities take a different approach from typical land trust efforts. HLPT is not intended to serve as a receptacle for land gifts, a typical function of land trusts. Rather to achieve its goals in the Housatonic watershed, HLPT will use the following techniques:

1) Identifying lands that should be preserved as integral components of our natural systems. This process would include identification of lands to be retained for productive forest or crop use, lands possessing significant recreational or scenic values, and lands most suited to absorb future growth;

2) Accepting parcels of land as gifts, providing donors the opportunity to benefit from the tax advantages of giving;

3) Purchasing land in cases where conservation goals are

outweighed by a landowner's financial needs;

4) Developing conservation and/or development plans for lands given or purchased. As appropriate, the title to these lands may later be passed to: a) local or regional land trusts or governmental entities if the parcel is to remain essentially undisturbed; or b) private parties after the establishment of restrictive easements. Sales transactions to private parties would raise much-needed funds for future projects, while simultaneously keeping lands on the tax rolls and removing the threat of misdirected development;

5) Counseling property owners and communities about the alternatives available for the achievement of their conservation and development goals.

In just three months of operation, the Housatonic Land Preservation Trust has the following four major projects under way in Connecticut's northwest corner.

Perhaps the most publicized has been HLPT's call to action for the preservation of a 233 acre dairy farm in Sharon. Having made the decision to sell, and in an effort to permanently preserve the property as a working farm, the owners had applied to Connecticut's Department of Agriculture for inclusion in the State's farmland preservation program. Under this program the State would purchase development rights over the prime farmland.

The farm was rated second highest among all farm applicants in the State by Dan Vuille, Deputy Commissioner of Agriculture. The farm has been listed with eight real estate firms and is highly attractive to individuals with speculative development objectives.

HLPT enlisted widespread support from public and private organizations as well as individuals interested in farmland preservation. The American Farmland Trust, based in Washington, D.C., has agreed to buy the property, on an interim basis, hoping to assume the owner's application and resell the development rights to the State under the preservation program.

At a December 21st meeting, State Agriculture Commissioner Leonard Krogh and his Advisory Committee moved the deadline for all farm applicants to March 1, 1982, to allow consideration of the Sharon farm, which had missed an earlier cut-off date. The committee also voted to allow an intermediary organization such as HVA or the American Farmland Trust to work with the owner without causing a change in the jeopardy rating of the farm or in the State's plans for purchasing the development rights on the prime farmland. The State Attorney General, however, recently offered the opinion that the committee's vote was not binding and a purchase by an intermediate agency might change the ranking of the farm.

The Commissioner of Agriculture has sent the American Farmland Trust a "letter of intent" to purchase the property, meanwhile, and the HVA, in cooperation with other conservation interests, is submitting to the State Legislature a suggestion for a change in the wording of the law that would assure that purchase by an intermediate agency would not affect a farm's jeopardy rating.

The 27-year old Housatonic Valley Association is a tax-exempt corporation with a membership of about 800, including private citizens, organizations, and businesses in the Housatonic River watershed. The association's purpose is to protect and preserve the natural environment of the Housatonic Valley.

Its activities include monitoring federal, state, and local government as well as private activities affecting the watershed, participating in regional planning efforts to insure proper land use and recreational development, working with government agencies on water quality issues, and educating the public on issues affecting the Housatonic Valley.

This past year the association launched the Housatonic Land Preservation Trust (see article). Its 1981 activities also focused on, among other issues, PCBs, water supply, land management, and Appalachian Trail management.

Second, HVA has received a gift of 38 acres in Warren. HLPT is in the process of developing a master plan for the property which contains a waterfall, rock outcroppings, and a small, developable portion. After placing conservation easements on the most critical portions of the property, HVA intends to offer the land to adjacent landowners or to other parties. Proceeds from this type of transaction will be deposited into a revolving land acquisition fund.

HLPT is also involved in developing a creative land package for a diverse 90 acre parcel in Salisbury. The package would involve purchase of the parcel and employment of the following: use of restrictive easements to preserve sensitive ecological areas; possible involvement of a local farmer with agricultural rights to 50 acres of the property; involvement of the National Park Service in purchasing easements on the Appalachian Trail portion of the property; and separation of non-critical parts of the property for potential residential development.

HLPT's most recent project involves a 325 acre parcel in Cornwall, composed of wooded land, open pasture land, and crop land. HLPT is assisting the landowner in the development of a master plan for the property, with the ultimate aim of identifying those portions of property most in need of permanent protection. Conservation easements will be developed for those areas so identified.

Beyond these specific efforts, the Trust Coordinator, Randi Lemmon, and HVA's Executive Director, Ralph Goodno, have provided other assistance, including the initiation of open space planning efforts in sev-

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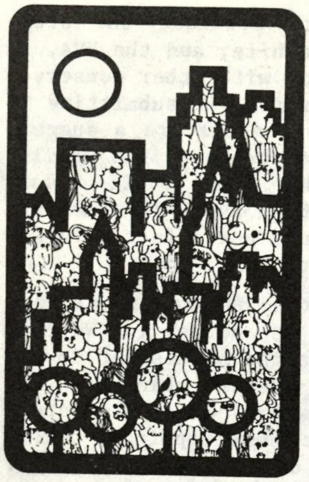


For Your Information

By Leslie Bieber,
Citizens' Participation Coordinator

State and federal agree upon priorities

The 1982 State/EPA Agreement was signed into effect in November of 1981. This document represents an effort by the DEP and the federal Environmental Protection Agency to coordinate the management of programs which fall within mutual areas of responsibility. In order to achieve this, certain environmental issues and projected accomplishments were identified as being of sufficient priority to merit special handling by the top management in each agency. Selection of issues was based on the magnitude of the environmental problem and the need for cooperative and coordinated efforts to solve these problems.

The following is a brief summary of the selected issues, along with the DEP project manager for each:

(1) Uncontrolled Hazardous Waste Sites: The objective is the investigation and mitigation of uncontrolled hazardous waste sites in the State. Using combined technical expertise, the State and the EPA will investigate environmental degradation caused by improperly disposed of hazardous waste and will provide sampling in conjunction with public health studies of such areas. Project Manager: Pat Bowe, 566-5712.

(2) The Regulation, Disposal, and Managment of Hazardous Waste: The objective is for the State to undertake the administration and enforcement of all functions of the federal Resource Conservation and Recovery Act Hazardous Waste Program and to establish a hazardous waste facility siting process. Connecticut has received interim authorization to operate Phase I of a federally approved regulatory program. In FY 1982, the State will apply for Phase II authorization and will work with EPA to coordinate permit actions. Project Manager: Pat Bowe, 566-5712.

(3) The Implementation of Groundwater Management Program: The FY 82 focus will be on completion of several groundwater management planning efforts and improvement of existing regulatory and construction grants programs as they impact groundwater quality. Improved State and federal coordination of groundwater contamination investigations and achievement of primary enforcement responsibility for the Underground Injection Control Program will also be important elements of the overall effort. Project Manager: Fred Banach, 566-2588.

(4) Management and Oversight of the Municipal Wastewater Construction Program: The major objective is to continue the delegation process from the EPA to the State while implementing an oversight program consistent with an executed Memorandum of Understanding and national EPA Policy. In addition, a joint effort to monitor and enforce compliance schedules for a number of high priority municipal projects will be continued from last year's program. Project Manager: William Hogan, 566-2793.

(5) 1982 Ozone and Carbon Monoxide State Implementation Plans (SIP): The objective is to track the State's progress in developing ozone and carbon monoxide standards plus a strategy to meet these standards. Project Manager: Phil Florkoski, 566-4030.

(6) Strategy for Control of the Interstate Transport of Water Pollutants: The major objective is to ensure that high level cooperation and coordinated pollutant control efforts occur between Connecticut and Massachusetts in regard to high priority interstate streams. EPA will take the lead in coordinating the input and participation of the working group, which will highlight specific problems and alternative control measures and will report on the degree of accomplishment. The rivers and their associated problems are: French River (heavy organic loads), Housatonic River (PCBs and phosphorus loads), and Connecticut River (combined sewer overflows). In addition, the working group will provide the primary coordination forum for actions dealing with PCBs in the Housatonic River. Project Manager: Charles Fredette, 566-2588.

(7) Solid Waste Management Program: The major objective is to investigate changes in legislation necessary to aggressively implement resource recovery. A second objective is to continue and complete the State's open dump inventory. Project Manager: Robert Myers, 566-5847.

The State/EPA Agreement emphasizes the coordination and integration of environmental programs. Linking planning, implementation, and integration of these programs will allow a systematic and efficient approach to solving Connecticut's environmental problems. Copies of the Agreement are on file at the DEP and are available for public review. ■

Getting your oars in the water...

Public boat launching sites in Connecticut

KEY TO FISH SPECIES

BB	*Brown bullhead*
WC	*White catfish*
CB	*Calico bass*
CP	*Chain pickerel*
K	*Kokanee*
LMB	*Largemouth bass*
SMB	*Smallmouth bass*
S	*Sunfish*
T	*Trout*
WP	*White perch*
YP	*Yellow perch*

The water is there! Plenty of it! Connecticut has over 500 sizeable lakes and ponds, both publicly and privately owned; three major river systems; 300 miles of stream open to public use; and about 250 miles of coastline on Long Island Sound.

And we've got fish -- game fish, pan fish, fresh water fish, salt water fish, native fish, stocked fish.

But just having the water and the fish isn't enough. An additional requirement is access, a way of getting onto the waters. The following is a guide to public access and boat launching facilities available in Connecticut.

AMOS LAKE, Preston, 105 acres. Access from Rt. 164 approximately 1 1/2 miles south of Preston City and junction with Rt. 165. CP, LMB, YP, T.

ANDERSON POND, North Stonington, 54.3 acres. Access area reached from Cossaduck Road about 3 1/2 miles north of Rt. 2 or from Glasgo Road about 4 miles south of Rt. 165. CP, YP, BB.

AVERY POND, Preston, 50.6 acres. Access area on Rt. 164 about 1/2 mile north of junction of Rts. 2 and 164. CP, LMB, YP.

BALL POND, New Fairfield, 89.9 acres. Access area at south end of lake reached via black top road on the east of pond running south from Rts. 39 and 37A. Moters prohibited. T.

BASHAN LAKE, East Haddam, 276.3 acres. Turn east off Rt. 82 onto Mt. Parnassus Rd., left onto Ballahack Rd., go about 1 mile to access area. LMB, T.

BATTERSON PARK POND, Farmington-New Britain. Maintained by New Britain. Turn southeast off Rt. 6 onto Fienemann Rd., left onto Slater Rd. for access area.

BEACH POND, Voluntown, 394.3 acres. Access area is on north side of pond. T.

BEACHDALE POND, Voluntown, 46 acres. Access area is on east side of Rt. 49, 1 mile north of Voluntown. LMB, YP, BB.

BEAVER BROOK POND, Windham, 12 acres. Approximately 2 1/2 miles northeast of Windham, about the same distance southeast of North Windham. Carry-in area -- motors prohibited. Boats prohibited prior to May 15. T.

BESECK LAKE, Middlefield, 119.6 acres. Access area on west side of Rt. 147 approximately 1 3/4 miles south of junction of Rts. 66 and 147. LMB, WC.

BIGELOW POND, Union, 18.6 acres. Access area in Bigelow Hollow State Park off Rt. 197. LMB, T.

BILLINGS LAKE, North Stonington, 105.1 acres. Access road is located almost opposite access road to Andersons Pond, is reached by traveling north from Rt. 2 about 3 1/2 miles on Cossaduck Rd. or by traveling south from Rt. 165 about 4 miles on Glasgo Rd. SMB, CP, YP.

BLACK POND, Middlefield, 75.6 acres. Access area located south of U.S. 66, approximately 2 miles east of I-91. LMB, CP.

BLACK POND, Woodstock, 73.4 acres. Access area located approximately 1 1/2 miles northwest of West Woodstock, about 2 miles north of Woodstock Valley. SMB, CP, YP, BB, T.

BOLTON LAKE, LOWER (WILLIMANTIC RES.), Bolton, 178.4 acres. Access area on U.S. 44A approximately 1 mile east of Bolton Notch. Motors limited to 6 h.p. SMB, YP, BB.

BOLTON LAKE, MIDDLE (WILLIMANTIC RES.), Vernon, 114.9 acres. Access area approximately 2 miles north of U.S. 44A. Motors limited to 6 h.p. YP.

BOLTON LAKE, UPPER (WILLIMANTIC RES.), Vernon, 35.5 acres. Access area approximately 2 miles north of U.S. 44A. Motors limited to 6 h.p. -- carry-in area. BB.

BURR POND, Torrington, 85 acres. Access area on west side of pond in Burr Pond State Park, approximately 1 mile west of Rt. 8 and about 6 miles north of Torrington. BB.

CANDLEWOOD LAKE, New Fairfield, 5,420 acres. Access at Squantz Pond State Park, off Rt. 39. Water levels are often too low for launching boats from trailers. Call Squantz Pond State Park in advance for information -- 797-4165. LMB, YP, WP, T.

CANDLEWOOD LAKE, Danbury. Travel north on Rt. 7 for 1 mile from junction with I-84; turn left on Candlewood Hill Rd.; after 1/2 mile turn on Nabby Road; after 3/4 mile turn right on Pocono Point Rd. and proceed for 1/4 mile to access area on left. A daily parking and launching fee of $.50 is charged on weekends and holidays from Veterans Day to Labor Day. Water levels are often too low for launching boats from trailers. Call Squantz Pond State Park in advance for information -- 797-4165.

CEDAR LAKE, Chester, 68 acres. Turn east off Cedar Lake Road at northern end of lake, approximately 1 mile north of Rt. 148, for access area. T.

COLEBROOK RIVER FLOOD CONTROL IMPOUNDMENT, Colebrook and Massachusetts. Both adjacent to Route 8. Connecticut or Massachusetts fishing license valid on entire impoundment. T.

COMPENSATING RESERVOIR, Barkhamsted, 387 acres. Access area, owned by the Metropolitan District Water Bureau, located just west of Rt. 219 about 4 miles northeast of New Hartford. Launching fee. Boats available for rental. T.

CRYSTAL LAKE, Ellington, 200.9 acres. Access area on west side of lake, off Rt. 30. Parking facilities are crowded, especially on weekends. T, YP, CP, SMB, LMB.

CRYSTAL LAKE, Middletown, 35.5 acres. Access area at south end of lake adjacent to Middletown Park, approximately 1/2 mile west of Millbrook Road. LMB.

DODGE POND, East Lyme, 33 acres. Access area is located 1/2 mile north of Rt. 156 and 1/2 mile west of Rt. 161, in the village of Niantic. Motors prohibited. LMB, CB, YP, T.

DOG POND, Goshen, 71.3 acres. Turn south on first blacktop road 1 mile west of Goshen on Rt. 4. Access area approximately 2 miles south. LMB, CP.

DOOLEY POND, Middletown, 28 acres. Access area reached from blacktop road at north end of pond off Rt. 17 approximately 3 1/2 miles south of Middletown and 3 1/2 miles north of Durham. LMB, YP.

EAST TWIN LAKE, Salisbury, 562.3 acres. Turn north on blacktop road off Rt. U.S. 44, 1 mile west of Housatonic River. Access area suitable for launching car top boats only. Parking facilities inadequate. LMB, YP, T, K.

GARDNER LAKE, Salem-Montville, 487 acres. Access area at south end of lake not far from Rt. 82. SMB, YP, T.

GLASGO POND, Griswold, 184.2 acres. Access area about 200 yards east of Route 201 and about 1/2 mile north of junction of Routes 201 and 165. LMB, P.

GORTONS POND, East Lyme, 70 acres. Turn west off Rt. 161 onto first black top road south of I-95. Access area approximately 2 miles south of turnpike and 3 miles north of Village of Niantic. LMB, CB.

GREEN FALLS RESERVOIR, Voluntown, 46.9 acres. Approximately 4 miles southeast of Voluntown, about 1 1/2 miles east of Rt. 49. T.

HAYWARD LAKE, East Haddam, 189.9 acres. Turn southwest off Rt. 85 onto Lake Hayward Road approximately 1 1/2 miles south of Colchester. Access area at north end of lake about 3 miles south of Colchester. Motors prohibited. LMB, YP, T.

HIGGANUM RESERVOIR, Haddam, 32 acres. Located just west of Rt. 81 in village of Higganum. Access is entirely undeveloped. Boats can be launched only with difficulty. T.

HIGHLAND LAKE, Winchester, 444 acres. Located approximately 100 yards west of dam at north end of lake. T, LMB, K, YP.

HOLBROOK POND, Hebron, 72.5 acres. Located 1 1/2 miles northwest of Hebron, approximately 1/2 mile east of Rt. 85. LMB, YP, CB.

HOPEVILLE POND, Griswold, 149.9 acres. In Hopeville State Park, 2 1/2 miles north of Rt. 138. Access poor, but usable. LMB.

HOWELLS POND, Hartland, 17.3 acres. Located 1 1/2 miles off Rt. 20 northwest of West Hartland. Access usable, but poor. T.

LAKE HOUSATONIC, Shelton, 328 acres. At Indian Well State Park on west side of lake; 2 1/2 miles northwest of Shelton, off Rt. 110. LMB.

LAKE KENOSIA, Danbury, 70 acres. Just off U.S. 202, approximately 2 miles west of junction of U.S. 202 and U.S. 7. LMB.

LAKE OF ISLES, North Stonington, 87.1 acres. Go north on first black top road east of junction of Rts. 164 and 2. Public access provided over entrance road to Charter Oak Boy Scout Camp. LMB, CP, YP, CB.

LAKE LILLINONAH, Bridgewater, 1,900 acres. Area located on north shore of impoundment on east side of Rt. 133 about 9 miles south of New Milford. Daily parking and launching fee of $.50 charged on weekends and holidays from Veteran's through Labor Day. LMB, SMB, YP, WP, CB.

LAKE LILLINONAH, Newtown. Access area located at mouth of Pond Brook off Hanover Road approximately 3 miles north of Rt. 84.

LAKE ZOAR, Southbury, 975 acres. Area approximately 2 1/2 miles south of Route 6 on east side of lake. LMB, SMB, YP, WP, CB, T.

LANTERN HILL POND, Ledyard, 15.1 acres. On Lantern Hill Road, 1 mile south of Rt. 2 and 4 1/2 miles north of Rt. 95. T.

LITTLE POND, Thompson, 65.4 acres. On southeast shore of pond, approximately 1 mile east of Rt. 193 and 1 1/2 miles south of Massachusetts state line. LMB, YP, CP, T.

LONG POND, North Stonington, 98.6 acres. Just south of Lantern Hill Pond; travel south from Rt. 2 on Lantern Hill Road or go north from Rt. 95 on Lantern Hill Road. LMB, CP, YP, T.

MAMANASCO LAKE, Ridgefield, 92 acres. At south end of lake. Turn south from Rt. 116 onto Mamanasco Rd. LMB, YP.

MASHAPAUG LAKE, Union, 297.1 acres. Access in Bigelow Hollow State Park, 2 1/2 miles north of Rt. 197. LMB, T.

MOHAWK POND, Goshen, 16 acres. About 3 1/2 miles southeast of Cornwall. Can also be reached from Litchfield. Directional signs from both. Motors prohibited.

MOODUS RESERVOIR, East Haddam, 451 acres. Two separate impoundments, one access area on each. LMB, YP.

Upper: Area located 2 miles east of Moodus and 1 mile southeast of Rt. 149, just south of causeway between upper and lower sections.

Lower: Access area Located just off Rt. 149 to the east.

MOREY POND, Ashford-Union, 40 acres. Area in Nipmuck State Forest off Rt. 190, about 1/2 mile northeast of junction of Rts. 190 and 89. BB, WC, CP.

MT. TOM POND, Litchfield, 61.5 acres. Limited access from Rt. 25 where pond is adjacent to highway. Shore fishing allowed in Mt. Tom State Park. T.

MUDGE POND, Sharon, 201 acres. Turn northeast off Rt. 4 approximately 1 1/2 miles north of Sharon. Located on east side of pond, 1/2 mile northeast of Rt. 4. LMB, YP.

NAUBESATUCK LAKE, Mansfield. Access area on Rt. 89 near Bassetts Bridge, 2 1/2 miles east of Mansfield Center and junction with Rt. 195. LMB, CP, T.

NORTH FARMS RESERVOIR, Wallingford, 62.5 acres. Access area located on Rt. 68, about 1 mile west of I-91. LMB.

NORWICH POND, Lyme, 27.5 acres. One-and-one-half miles south of Hamburg on Rt. 156, turn east onto access road. Pond is 2 1/2 miles east. Motors prohibited. T.

PARK POND, Winchester, 77 acres. Access area at north end of pond approximately 2 miles east of Rt. 272 and 2 1/2 miles west of Winchester Center.

PATACONK LAKE, Chester, 55.5 acres. Located at Cockaponset State Forest, 3 miles north of Rt. 148 on Cedar Lake Road. Access usable, but poor. Boats can be launched only with difficulty. T.

PATAGANSET LAKE, East Lyme, 12.3 acres. Located 1 mile west of Flanders Village, just north of Rt. 51. LMB, CP, YP, CB.

PICKEREL POND, Colchester, 88.6 acres. Access area at north end of pond. Go west about 1 1/2 miles on first blacktop road off Rt. 149 south of Rt. 16. Area approximately 5 1/2 miles southwest of Colchester. LMB, SMB.

POWERS LAKE, East Lyme, 152.6 acres. Travel north approximately 2 1/2 miles over first blacktop road off Boston Post Road west of Pataganset Lake. BB, WC, CP.

QUADDICK RESERVOIR, Thompson, 466.8 acres. Access in Quaddick State Park, 4 miles north of East Putnam and U.S. 44. LMB, SMB, CP, YP.

QUONNIPAUG LAKE, Guilford, 111.6 acres. Access area at north end of lake just off Rt. 77. Parking facilities limited. LMB, CP, YP, T.

RAINBOW RESERVOIR, Windsor, 235 acres. Access area approximately 2 miles west of village of Rainbow on north shore of impoundment. Launching ramp usable at all water levels.

ROGERS LAKE, Old Lyme, 264.9 acres. Turn off Rt. 51 onto Grassy Hill Road and travel north about 1 mile. LMB, YP, T.

ROSELAND LAKE, Woodstock, 88 acres. Access area owned by Putnam Fish and Game Club, made available courtesy of the club. Located 1 mile east of South Woodstock, at south end of lake. LMB, YP, CB, S.

SILVER LAKE, Berlin, 151 acres. Access area at northwest end of lake between lake and railroad tracks and about 1 mile west of the Berlin Turnpike. CB, WC.

SQUANTZ POND, New Fairfield, 288 acres. Access at Squantz Pond State Park, east of Rt. 39. Access usable, but poor. Water levels are often too low for launching boats from trailers. Call park (797-4165) for current information. LMB, YP, WP, T.

TYLER POND, Goshen, 182 acres. Access area reached by black top road northeast of Rt. 4, approximately 3 miles west of Goshen. Parking facilities limited. YP, T.

UNCAS LAKE, Lyme, 69 acres. Access over same road that provides access to Norwich Pond. Turn east off Rt. 156, 1 1/2 miles east of Hamburg. Motors prohibited. T, CP.

WAUMGUMBAUG LAKE, Coventry, 377.5 acres. Turn south off Rt. 31 on first blacktop road west of South Coventry. Access area located about 3/4 mile from Rt. 30 southwest of dam. YP, SMB.

WEST HILL POND, Barkhamsted, 238.3 acres. Turn west off U.S. 44 just beyond junction of U.S. 44 and Rt. 181. Access area approximately 3 1/2 miles off U.S. 44. T, K.

WEST SIDE POND, Goshen, 42.2 acres. Travel 1 mile west on West Side Road off Rt. 63, 1 mile north of Goshen. Can also be reached by turning northeast off Rt. 4 onto Foster Road and traveling approximately 2 miles. LMB, YP, T.

WINCHESTER LAKE, Winchester, 229 acres. Area at south end of lake near dam, approximately 2 1/2 miles east of Rt. 272 and 2 miles northeast of Winchester Center. LMB, CB, CP, YP.

WONONSCOPOMUC LAKE, Salisbury, 352.6 acres. Owned by the town of Salisbury; available to the public for a fee. Area is located in village of Lakeville, 1,500 feet south of junction of Rts. 44 and 41. Boats available for rental. T, CP, K.

WOOD CREEK POND, Norfolk, 151 acres. Area located 1 mile east of Rt. 72 off Doolittle Pond Road. LMB.

WYASSUP LAKE, North Stonington, 92.7 acres. Approximately 4 miles north of village of North Stonington and 7 miles south of Voluntown. Directional signs from Rts. 2 and 49 indicate roads to follow. SMB, T.

Rivers

Connecticut River

East Hartford. Owned by town of East Hartford. Located between the Charter Oak and Founders Bridge. Parking fee.

East Haddam. Located at mouth of Salmon River, 1 1/2 miles north of East Haddam, off Rt. 149.

Enfield. Owned by town of Enfield and located just south of bridge in village of Thompsonville. Provides access north of the Enfield Dam.

Enfield. Owned by CL & P Co. and leased to the DEP. Located 1 mile northwest of junction of U.S. 5 and Interstate 91. Provides access to the shad fishing area from Kings Island to the Enfield Dam.

Haddam. Access area in Haddam Meadows State Park, just east of Rt. 9 in village of Haddam.

Hartford. Located in Riverside Park, just north of Bulkeley Bridge. Fee.

Suffield. Located on Canal Rd., off Rt. 159 just south of Suffield-Enfield Bridge. Provides access to river north of the Enfield Dam and the state-owned shore fishery for shad at the dam.

Windsor. Located just south of the Windsor-South Windsor Bridge in village of Wilson. Provides access to shad fishing area north of the bridge.

Old Saybrook. Access area located under Baldwin Bridge. Provides access to lower Connecticut River and to Long Island Sound.

Farmington River

Windsor. Owned by town of Windsor and located just west of Rt. 159. Provides access to shad fishery in lower Farmington River and also to the Connecticut River.

Thames River

Ledyard. Access in Stoddard Hill State Park. Provides access to striped bass fishery in the Thames River.

Salt Water

BARN ISLAND, Stonington. Turn southeast off Rt. U.S. 1 at Wequetequock. Area is due south of Wequetequock, approximately 1 1/2 miles on Wequetequock Cove.

BAYBERRY LANE, Groton. Access area is located on Bakers Cove, 2 1/2 miles southeast of Groton and 1 mile east of Coast Guard Station.

BRANFORD RIVER, Branford. Access area located on Branford River approximately 2 miles south of Branford Center. Turn south off Rt. 1 onto Rt. 142.

DOCK ROAD, Waterford. Access area located on Jordan Cove at Pleasure Beach, approximately 2 miles south of Rt. 156.

EAST RIVER, Guilford. Access area reached by traveling south from U.S. 1 on Neck Road approximately 1 1/2 miles. Located on east bank of East River, 3 miles southwest of Madison.

FOUR MILE RIVER, Old Lyme. Located on west side of Four Mile River opposite Rocky Neck State Park and approximately 1 1/2 miles south of Rt. 156.

GREAT ISLAND, Old Lyme. Access area located at south end of Smith Neck Road, approximately 1 mile south of Rt. 156 and 2 1/2 miles south of U.S. 1 and the Baldwin Bridge.

HOUSATONIC RIVER, Located under the I-95 Bridge in Devon. Area reached by turning north from Rt. 1 onto Naugatuck Ave. Under renovation May-July 81.

LIGHTHOUSE POINT, New Haven. Access area located in Lighthouse Point Park, approximately 3 miles south of Interstate 95. Launching should present no problem except in strong wind directly out of west. Fee charged during summer park season. Under renovation May 81.

NIANTIC RIVER, Waterford. Access area located approximately 1/4 mile northeast of Rt. 156 bridge across Niantic River. Launching ramp usable at any tide in any wind short of gale conditions. Fee charged on weekends and holidays from May 30 through Labor Day.

SAUGATUCK RIVER, Westport. Off Rt. 136, approximately 1/4 mile east of Saugatuck River on Underhill Parkway, under the I-95 bridge. Under consturction May-July 81.

SEASIDE PARK, Bridgeport. Access area located in Seaside Park on west side of Bridgeport Harbor, approximately 1 1/2 miles south of Interstate 95. Fee charged during summer park season.

THAMES RIVER, New London. Located beneath the Gold Star Memorial Bridge on west side of river. Launching ramp usable at any tides and under most wind conditions. ■

Manager award

From page 2

is a member of the Connecticut General Assembly's Acid Rain Task Force.

Moore graduated from Trumbull High School and earned Bachelor's and Master's degrees in engineering from the University of Connecticut.

The Distinguished Managerial Service Awards program was established to "help focus more attention on the overall quality and dedication of the men and women in the state service and to recognize distinguished service by state managers." There are approximately 1400 state managers.

Members of the Distinguished Managerial Service Awards Committee included Alice Ayers, Executive Director, Connecticut Trial/Lawyers Association; Robert Franklin, President of the Connecticut Public Expenditures Council; Deputy Secretary of the State Maura Melley; Hartford County Manufacturers Association President Richard Noyes; David Ogle, Executive Director, Joint Committee on Legislative Management; George Russell, Director, Staff Services, Department of Environmental Protection, chairman; and Bruce Chamberlain, Management Relations Director, State Personnel Division, Department of Administrative Services, secretary.

Among other nominees for the Distinguished Managerial Service Awards was Dr. Hugo Thomas, State Geologist and Director of the DEP's Natural Resources Center. ■

P-R funds

From page 7

ment and conservation. Funds may also be used for construction, operation, and maintenance of public target ranges.

In general, participating states have used 50 percent of apportioned funds for development, 26 percent for research, and 19 percent for land acquisition. The remaining 5 percent goes for administration of the program by the U.S. Fish and Wildlife Service.

Over the years, in Connecticut, P-R monies have been used for land acquisition, development, research and survey, and coordination projects. Recently, the development and coordination projects were dropped and technical guidance and hunter education projects undertaken. Past emphasis on development work on state-owned lands has given way to providing technical assistance on privately owned habitat and input into forestry operations on state lands to improve conditions for wildlife. The need to acquire lands as wildlife habitat persists and is even more important today in light of constant habitat loss through man's encroachment. The monitoring of population trends for selected wildlife species has expanded to include species management studies on deer, turkey, furbearers, waterfowl, and small game. Hunter education in Connecticut received increased emphasis in 1981 with the approval of a P-R hunter education project to upgrade and revitalize the existing program.

Connecticut's Pittman-Robertson funds apportionment has constantly grown. In 1981, $651,000 was available; and in 1982, an estimated $790,000 will be apportioned to Connecticut for use on approvable projects. To fully utilize its apportionment, Connecticut has always relied heavily on obligating P-R funds for land acquisition using Bond funds. Sufficient General Fund monies have not been available to fully fund other approvable activities despite the 75 percent federal reimbursement available. The DEP's Wildlife Unit has waged a constant battle to prevent large scale reversions of Connectut's sizeable Pittman-Robertson apportionments.

For 45 years the Federal Aid in Wildlife Restoration or Pittman-Robertson Program has been a reliable, stable, and ever increasing source of funds to improve and expand the management of Connecticut's wildlife resources and services to sportsmen and wildlife enthusiasts. The ability to continue to readily take advantage of this long-standing federal program rests with state legislators and fiscal policymakers. Support in the form of increased budgets and favorable fiscal policies is needed to clear the way. ■

Connecticut Bicycle Day

Sunday, May 16, celebrate Connecticut Bicycle Day with a 25-mile (40 km.) recreational ride and rally sponsored by the Coalition of Connecticut Bicyclists, Inc., with the support of the Yankee Council of American Youth Hostels, the Middlesex Bicycle Club, and the Central Connecticut Cycling Club. The ride begins at 9 a.m. sharp at Stratton Brook State Park on Rt. 309 (Farms Village Road) in Simsbury.

First stop on the tour is the Great Pond State Forest Chapel where the Reverend Rick Lanz will officiate at a brief blessing of the bicycles. From there the ride will head for the McClean Game Refuge in Granby and on through Canton. (A shorter ride is also possible.) Riders are encouraged to wear helmets. Bring your own food.

Interested riders are asked to register by mail ($1 fee for Coalition members; $2 for others) with: Coalition of Connecticut Bicyclists, P.O. Box 121, Middletown, CT 06457. Register by May 10; include stamped, self-addressed business envelope. For information, call: Lou Roushon, 529-3289 or Ken Wargo, 246-7171 (Hartford area); Jean Unfricht, 776-1637 (New Haven), or John Duffy, 281-1709. ■

Haberdashery

To further increase public awareness of the return of the Atlantic salmon to the Farmington River, the Farmington River Watershed Association is selling an Atlantic salmon necktie. The navy blue, all silk tie sports a leaping salmon. Cost is $19.89 (including tax) each. Proceeds will be used to further salmon restoration efforts on the Farmington River. For additional information, contact FRWA headquarters, 195 W. Main St., Avon, CT 06001 (678-1241). ■

Thames Exhibit

The Thames Science Center in New London will be offering "THAMES," an exhibit on the Thames River and its tributaries, now through June.

The exhibit includes photographs, drawings, text, maps, specimens, and a battery-operated identification board. It features satellite and microscopic views of the river's 1,500 square mile watershed, ranging from upland brooks, streams, and rivers to the estuary at Long Island Sound.

"THAMES" is the Center's second exhibit focusing on the natural and physical attributes of the Thames River Basin.

To arrange for school or other groups that wish to take advantage of this special exhibition and related educational program, call the Center (Gallows Lane, New London) at 442-0391. ■

Outdoor Education Workshop

The Connecticut Outdoor Education Association will hold its 1982 spring workshop, entitled "Cornucopia," on April 30, May 1, and May 2 at the Episcopal Conference Center in Ivoryton, Connecticut.

Among the wide variety of courses for teachers, naturalists, and youth group leaders the workshop is offering will be:

* puppetry and clowning
* nature sketching and crafts
* birding and animal tracking
* rock climbing and orienteering
* nature trail building
* special education outdoors

There will also be a special New Games Festival, an environmental issues forum, and a campfire and multi-media show.

Price, including registration, accommodations, and six meals, for tent camping is $33 for members, $38 for non-members; for cabins, $43 for members, $48 for non-members. Deduct $3 from these fees by registering before April 1. Day participants may attend a full day of courses for $10 (meals not included).

To register, or for course information, write: Charlotte Viani, Auer Farm, Simsbury Road, Bloomfield, CT 06002. ■

Conservation Center Announces Spring Program

Maple syrup, waterfowl and wildlife marshes, fly-tying and casting, birds, beavers, and wildflowers are among the subjects featured in this spring's program at the Goodwin State Forest's Conservation Center in Hampton, Connecticut.

MAKING MAPLE SYRUP
Fri., Mar. 19, at 7 p.m.

A slide and talk program by Steve Broderick, extension forester.

WATERFOWL & WILDLIFE MARSHES
Sat., Mar. 27, at 10 a.m.

Bring canoe & binoculars to join Tim Linkkila, D.E.P. wildlife biologist, on Pine Acres Pond.

FLY-TYING & CASTING
Sat., Apr. 3, at 10 a.m.

Demonstration, hints, & question/answer period by members of the Connecticut Fly Fisherman's Association, Elmer Latham, chapter president.

SEE THE FOREST
Sat., Apr. 10, at 2 p.m.

Take a 5-mile hike and identify 15 species of trees with Lois Kelley, Conservation Center director. About 3 hrs. Bring snack.

NON-FISHERPERSON'S SPECIAL
Sat., Apr. 17, at 11 a.m.

Bring sandwich for a lunchtime walk on the yellow trail (3 miles) with Lois Kelley, Conservation Center director. About 3 hours.

FAMILY BIRDWALK
Sat., Apr. 24, at 4:30 p.m.

Bring binoculars to look & listen with Ellen Hobby, naturalist. Sandwich or snack suggested.

THE FOREST AT DAWN
Sat., May 1, at 5:30 a.m.

Jim Pepe, outdoor leader, challenges you to this dawn celebration. Bring binoculars, thermos, heavy sweater, and footwear that won't be hurt by the morning dew. A quiet walk.

BEAVERS BY MOONLIGHT
Fri., May 7, at 7:30 p.m.

Gather for introductory slides with Juan Sanchez, director of Manchester's Oak Grove Natural Science Center, then walk by the light of the almost-full moon. Bring flashlight.

MAY WILDFLOWERS
Sat., May 15, at 2 p.m.

A walk to see what's out, with Lois Kelley, Conservation Center director.

NATURALISTS' FREE-FOR-ALL
Sat., May 22, 9 am to 3 pm

Join with us and our fantastic outdoor friends to celebrate the season. Bring camera, smile, canoe or rowboat if available, field guides, binoculars, other such paraphernalia.

JUNE WILDFLOWERS
Sat., June 5, at 2 p.m.

Bring camera and hunt the latest with Alfred Fredette, nature photographer.

For more information or directions, call Lois Kelley, Goodwin Conservation Center director, at (203) 455-9534. The Goodwin State Forest Conservation Center is located in Hampton. Look for the entrance on Route 6 about eight miles east of Willimantic, or ten miles west of Danielson. ■

Permits Issued

Encroachments

12/21/81: Angeline Brighenti, New Britain
To construct sanitary sewer lines and outlet storm drainage riverward of established stream channel encroachment lines for Bass Brook in New Britain. Conditions.

Structures & Dredging

12/17/81: Gladys Markus, Fairfield
To place a 38 foot bulkhead and fill in Pine Creek in Fairfield. Conditions.

12/18/81: Marguerite Brow, Meriden

To place 200 cubic yards of rock and sand 40 ft. beyond mean high water to protect a pile-supported house in Madison. Conditions.

12/29/81: Walter Parsell, Bridgeport
To retain and maintain an anchor secured 7' x 200' floating dock extending 200' beyond mean high water. Conditions.

1/6/82: Coyne Investment Property, Darien
To construct a 450' bulkhead and maintenance dredge approximately 19,400 cubic yards of material in the West River at West Haven. Conditions.

1/13/82: Equitable Life Assurance Society, Norwalk
To place an 8-inch sewer outfall extending 15' beyond mean high water in the Housatonic River at Milford. Conditions.

1/14/82: Neil Callahan, Darien
To construct a fixed ramp and floating dock in Holly Pond off Weed's Landing, Darien. Conditions.

1/14/82: Michele W. Speidell, Andover, Mass.
To construct a 4' x 56' pier with attached ramp and 12' x 14' floating dock, extending 90' beyond mean high water in Mystic Harbor at Noank. Conditions.

1/22/82: Stonington Seafood Products, Inc., Stonington
To construct an L-shaped pier extension 11' x 73' x 222' off Northwest Street in Stonington Harbor. Conditions.

Tidal Wetlands

1/[illegible]/82: Robert & Ruth Jensen, Old Saybrook
To place and maintain 29,600 cubic feet of fill on 7,400 square feet of state-designated tidal wetlands and construct and maintain a wooden retaining wall at Sheffield St., in Old Saybrook. Conditions.

1/6/82: Nancy B. Krieble, Old Lyme
To retain and maintain fill within reconstructed stone bulkheads in designated tidal wetlands in the Calves Island area, Old Lyme. Conditions.

Inland Wetlands

12/18/82: William Johnson, Wallingford
To create a drainage swale within inland wetlands for storm water runoff from a 5-lot residential subdivision 200' east of the Cheshire town line on Gaylord Farms Rd., in Wallingford. Conditions.

1/5/82: Chris Bargos, Trumbull
To fill approximately 500 sq. ft. of inland wetland to construct a house and driveway on Beaver Dam Rd., in Stratford. Conditions.

1/8/82: Stanley Simon, New London
To retain and maintain a 7' steel stairway, a 6' ramp and a 4' x 25' floating dock in Greens Harbor off Pequot Ave., New London. Conditions.

1/11/82: Eugene Michaud, West Hartford
To excavate a 1/5 acre pond within inland wetlands in the Town of Willington. Conditions.

Water Compliance

12/16/81: Tilcon Tomasso, North Branford
To discharge wash and cooling water generated from a sand washing and stone crushing operation to a tributary of Cussgutter Brook. Conditions.

12/26/81: Hamden Tire Salvage, Inc., Branford
To operate and maintain a tire landfill on State Street in the Towns of Hamden and North Haven with the resultant leachate discharge to the groundwaters of the State. Conditions.

12/23/81: Union Manufacturing Company, Meriden
To discharge to Harbor Brook 24,750 gallons per day of wastewaters, cyanide destruct, Compressor cooling water, and degreaser cooling water. Conditions.

12/23/81: Tilcon Tomasso, North Branford
To discharge treated wastewaters from sand washing and stone crushing operations to a tributary of Cussgutter Brook in Bristol. Conditions.

12/23/81: United States Postal Service, New England Field Real Estate and Buildings Office, Lexington, Mass.
To discharge interceptor well discharge from the North Meadows postal facility to an unnamed tributary to the Connecticut River. Conditions.

1/5/82: Suisman and Blumenthal, Inc., Hartford
To discharge to the Metropolitan District Sewerage System an average daily flow of 30,000 gallons per day of treated chip washing wastewaters. Conditions.

1/5/82: Automatic Business Products, Willimantic
To discharge printing plate washout to the groundwaters in the watershed of the Shetucket River. Conditions.

1/5/82: Town of Washington
To discharge filtrate from the septage disposal system to the groundwaters of Mallory Brook watershed. Conditions.

1/5/82: Benjamin Gilbert, Stamford
To discharge 1650 gallons per day of domestic septic tank effluent to the groundwaters in the watershed of Long Island Sound. Conditions.

1/5/82: Madison Builders Company, Madison
To discharge 14,400 gallons per day of treated domestic sewage to Cold Spring Brook and Long Island Sound Watershed in Westbrook. Conditions.

1/5/82: Town of New Milford, Board of Education
To discharge 11,250 gallons per day of domestic sewage through a septic tank leachfield system and then to the groundwaters in the Town of New Milford. Conditions.

1/5/82: Julius Rytman, Franklin
To discharge 1,400 gallons per day of excess drinking water to the groundwaters in the Yantic River Watershed in Lebanon, to discharge 980 gallons per day of egg wash wastewater to the groundwaters in the Yantic River Watershed, and to operate 5 caged poultry houses (four of shallow pit construction and one of deep pit construction) that will store, treat, and dispose of animal waste products. Conditions. ■

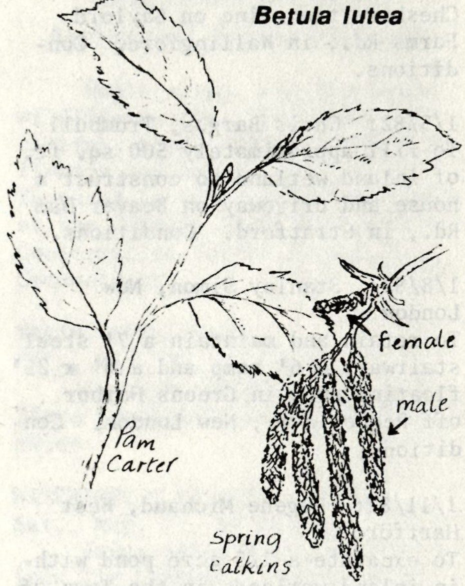
Trailside Botanizing

by G. Winston Carter

One of the first things you are apt to notice about the yellow birch is the gold and silver curls that are present over much of its bark. These curls are thin and may glisten. This effect may be seen on a walk in the woods in the winter because the bark is lighted by sunlight or snow. If you observe a curl of yellow birch bark more closely, you may notice its color alternates from silver to gold.

The catkins, or flowers, are another attractive feature of the yellow birch. The male flowers form in the fall. During the winter months they appear as tight, rigid projections as they are in the dormant stage. They become long and pendant in the spring when they expand and produce pollen. The female flowers are nearly erect and shorter, appearing above the male. Both types of catkins are found on the same tree.

Yellow birch
Betula lutea



This species of birch is most common in rich, moist woodland along streams and swamps, although it is also found quite abundantly on damp, shady, hilly slopes. It is intermediate in its shade tolerance and requires at least some opening in the canopy for successful establishment. It is very sensitive to fire, but can regenerate from roots and sprouts fairly well following a fire.

The sap and leaves of yellow birch contain oil of wintergreen, a characteristic shared with black birch. However, it is not present in as great an abundance. The wood of yellow birch is used in many ways. Some of its uses are for flooring, furniture, and firewood. The bark is valuable for starting campfires because it is flammable even when it is wet. Many kinds of wildlife utilize the plant for food.

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State of Connecticut
Department of Environmental Protection
State Office Building
Hartford, Connecticut 06115

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